

REMARKS

Reconsideration of this application is respectfully requested.

A. Cross-reference to related applications

The Applicants wish to draw the Examiner's attention to the Applicants' related co-pending applications and issued patents (see revised Appendix A) directed to nanoparticles and methods of preparation and use thereof.

B. Status of the claims

Claims 433, 435-443, and 445-461 are pending in this application.

C. Obviousness-type double patenting rejection

Claims 433 and 435-439 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 5-9 of U.S. Patent No. 6,682,895. A terminal disclaimer is attached. Accordingly, withdrawal of the rejection is in order and is respectfully requested.

D. Rejection under 35 U.S.C. section 102(e) or alternatively under 103(a) based on Kausch and Yguerabide

As a threshold matter, the Federal Circuit has stated that for prior art to anticipate under section 102, every element of the claimed invention must be identically disclosed in a single reference. Corning Glass Works v. Sumitomo Electric, 9 U.S.P.Q.2d 1962, 1965 (Fed. Cir. 1989). The exclusion of a claimed element, no matter how insubstantial or obvious, from a reference is enough to negate anticipation. Connell v. Sears, Roebuck & Co., 220 U.S.P.Q 193, 1098 (Fed. Cir. 1983).

Likewise, the Federal Circuit reiterated the manner in which obviousness rejections are to be reviewed. Where claimed subject matter has been rejected as obvious in view of a combination of prior art references, "a proper analysis under § 103 requires, *inter alia*, consideration of two factors: (1) whether the prior art would have suggested to those of ordinary skill in the art that they should make the claimed composition or device, or carry out the claimed process; and (2) whether the prior art would also have revealed that in so making or carrying out,

those of ordinary skill would have a reasonable expectation of success." *In re Vaeck*, 947 F.2d 488, 493, 20 U.S.P.Q.2d 1438, 1485 (Fed. Cir. 1991), citing *In re Dow Chemical Co.*, 837 F.2d 469, 473, 5 U.S.P.Q. 2d 1529, 1531 (Fed. Cir. 1988).

Contrary to the Examiner's position, the Applicants submit that neither Kausch nor Yguerabide teach or suggest the Applicants' presently claimed invention.

1. Kausch

Claims 433, and 435-461 stand rejected under 35 USC section 102(e) as anticipated by or, in the alternative, under 35 USC section 103(a) as obvious over Kausch et al. (U.S. Patent no. 5,665,582)("Kausch"). The Examiner alleged that Kausch disclosed a method for isolating and sorting biological materials and points to the abstract, col. 4-10, 17-19, 24 and Examples 1, 2 and 4-8 for support. The Applicants respectfully traverse these rejections.

The Applicants respectfully submit that the Examiner's reliance on Kausch is misplaced as Kausch does not support the Examiner's assertions. Kausch described a method for isolating biological materials. Kausch first anchors the biological material onto a solid support such as a glass slide or coverslip. The anchored biological material is then labeled with a binding composition and magnetic particles. The labeled biological material is then released from the support and the release material is then sorted by a magnetic force. The Examiner's cited passages of the Kausch support the aforementioned method. See abstract and cols. 4-10, particularly col. 6, lines 24-44 and col. 9, lines 44 to col. 10, line 16. Example 1 described isolation and anchoring of mouse DNA onto glass coverslips and use of magnetic particles to sort out the DNA. See col. 28, line 51 to col. 29, line 3. Example 2 also described anchoring chromosomes onto an alginate cushion, followed by detachment of the chromosomes and sorting using magnetic particles. Examples 4 (col. 39 – use of magnetic particles for sorting), 5 (col. 44 – preparation of magnetic particles), 6 (cols. 44 and 45 – conventional flow cytometry), 7 (cols. 45-50 – anchoring biological material to support, detachment of biological material from support, and sorting by magnetic particles) and 8 (cols. 50-52 – anchoring biological material to support, detachment of biological material from support, and sorting by magnetic particles). Indeed, Kausch specifically stated the following:

An important and unique aspect of this invention is that materials are labeled while they are anchored to a solid support, and then released to facilitate sorting. Another important aspect is that the indicator used is small relative to the biological material so that steric hinderance is not a problem, cross-aggregation is minimized, the structure of the biological material is preserved, and the resolution of the signal/target is improved.

See col. 10, lines 9-17. Thus, Kausch teaches a method that is remote from the present invention in that his method employs a different process for separating target molecules. While Kausch describes binding compositions that employ various labels or indicators such as fluorescent labels and colloidal gold, a disclosure of colloid gold as a label is not a disclosure or suggestion of the presently claimed invention. Indeed, Kausch makes a point that the use of indicators is such that cross-aggregation is minimized, thus teaching away from the presently claimed invention. Hence, there is no discussion or suggestion of any method in Kausch for separating out one or more types of selected nucleic acids from a sample via the aggregation and precipitation of nanoparticle-based complexes as presently claimed.

Accordingly, withdrawal of the section 102(e) and alternative section 103(a) rejection of the claims based on Kausch is in order and is respectfully requested.

2. Yguerabide

Claims 433, and 435-461 stand rejected under 35 U.S.C. section 102(e) as being anticipated by or, in the alternative, under 35 U.S.C. section 103(a) as obvious in view of Yguerabide (U.S. Patent No. 6,214,560) ("Yguerabide"). Specifically, the Examiner alleged that the presently claimed invention is anticipated or obvious because Yguerabide allegedly disclosed a method for detecting analytes and particle surface density. Applicants respectfully traverse and submit that Yguerabide cannot be applied to support an anticipation and/or obviousness rejection against the claims.

It should be noted that the Examiner has alleged teachings of detecting methods allegedly found on col. 74. While Yguerabide relates to detection of target analytes using bound particles, his focus is strictly on detection, not separation of target nucleic acids by aggregation and precipitation of nanoparticle-based complexes. Yguerabide does not teach or suggest any

method for separating out one or more types of selected nucleic acids from a sample via the aggregation and precipitation of nanoparticle-based complexes as presently claimed. Nor does Yguerabide teach that it would be possible to do. Indeed, Yguerabide is completely silent with respect to aggregating and precipitating out nanoparticle-based complex in a method to separate out target nucleic acids.

Furthermore, the Examiner also alleged teachings of "particle surface density" in the '560 patent. The discussion is allegedly found starting in column 82, line 35, in Yguerabide. In column 83, lines 11-21, Yguerabide discusses that such particles can be metal-like particles. Column 83 provides further discussion regarding particle size and particle binding to a surface. There is no discussion of any surface density of oligonucleotides present on the surface of the particles anywhere in Yguerabide.

Accordingly, withdrawal of the section 102(e) and alternative section 103(a) rejections of the claims based on Yguerabide are in order and is respectfully requested.

E. Conclusion

The Applicants respectfully submit that the claims in this application are in allowable condition and request a Notice to this effect.

Reconsideration of this application is respectfully requested and a favorable determination is earnestly solicited. The Examiner is invited to contact the undersigned representative if the Examiner believes that this would be helpful in expediting the prosecution of this application.

Dated: _____

McDonnell Boehnen
Hulbert & Berghoff LLP
300 South Wacker Drive
Chicago, IL 60606
Telephone: 312-913-0001
Facsimile: 312-913-0002

Respectfully submitted,


Emily Migo

Reg. No. 35,285

APPENDIX A

| ATTY Case No. | Serial No./ Filing Date | Inventors/Title | Status |
|------------------|--|---|---|
| 00-653-G | U.S. 10/794,741 Filed 3/5/04 | Mirkin, Letsinger, Mucic, Storhoff, Elghanian, Taton, Garamella, Li, Park/ NANOPARTICLES HAVING OLIGONUCLEOTI DES ATTACHED THERE TO AND USES THEREFORE | PENDING |
| 00-713-B1 | 09/923,625 Filed 8/7/01 | Mirkin, Letsinger, Mucic, Storhoff, Elghanian/ NANOPARTICLES HAVING OLIGONUCLEOTI DES ATTACHED THERE TO AND USES THEREFOR | U.S. Patent no. 6,773,884, issued 8/10/04 |
| 00-713-C | 09/344,667, filed 6/25/99 | Mirkin, Letsinger, Mucic, Storhoff, Elghanian/ NANOPARTICLES HAVING OLIGONUCLEOTI DES ATTACHED THERE TO AND USES THEREFORE | U.S. Patent No. 6,361,944, issued 3/26/02 |
| 00-713-I | U.S.S.N 09/603,830 Filed 6/26/00 | Mirkin, Letsinger, Mucic, Storhoff, Elghanian, Taton; NANOPARTICLES HAVING OLIGONUCLEOTI DES ATTACHED THERE TO AND USES THEREFOR | U.S. Patent No. 6,506,564, issued 1/14/03 |
| 00-713-I-1 | 09/961,949 9/20/01 | Mirkin, Letsinger, Mucic, Storhoff, Elghanian, Taton; | U.S. Patent No. 6,582,921, issued June 24, 2003 |

| ATTY Case No. | Serial No./ Filing Date | Inventors/Title | Status |
|--------------------------|------------------------------------|---|--|
| | | NANOPARTICLES HAVING OLIGONUCLEOTI DES ATTACHED THERE TO AND USES THEREFOR | |
| 00-713-I-2 | 09/957,318 9/20/01 | See 00-713-I-1 | U.S. Patent No. 6,759,199, issued 7/6/04 |
| 00-713-I-3 | 09/957,313 9/20/01 | See 00-713-I-1 | U.S. Patent No. 6,645,721, issued 11/11/03 |
| 00-713-I-4 | 09/966,491 9/28/01 | See 00-713-I-1 | U.S. Patent No. 6,610,491, issued August 26, 2003 |
| 00-713-I-5 | 09/966,312 9/28/01 | See 00-713-I-1 | U.S. Patent No. 6,673,548, issued January 6, 2004 |
| 00-713-I-6 | 09/967,409 9/28/01 | See 00-713-I-1 | U.S. Patent No. 6,740,491, issued May 24, 2004 |
| 00-713-I-7 | 09/974,500 10/10/01 | See 00-713-I-1 | U.S. Patent No. 6,709,825, issued March 23, 2004 |
| 00-713-I-8 | 09/974,007 10/10/01 | See 00-713-I-1 | PENDING |
| 00-713-I-9 | 09/973,638 10/10/01 | See 00-713-I-1 | ALLOWED |
| 00-713-I-10 | 09/973,788 10/10/01 | See 00-713-I-1 | U.S. Patent No. 6,720,411, issued April 13, 2004 |
| 00-713-I-11 | 09/975,062 10/11/01 | See 00-713-I-1 | U.S. Patent No. 6,677,122, issued January 13, 2004 |
| 00-713-I-12 | 09/975,376 10/11/01 | See 00-713-I-1 | PENDING |
| 00-713-I-13 | 09/975,384 10/11/01 | See 00-713-I-1 | PENDING |

| ATTY Case No. | Serial No./ Filing Date | Inventors/Title | Status |
|--------------------------|------------------------------------|--|---|
| 00-713-I-14 | 09/975,498 10/11/01 | See 00-713-I-1 | ALLOWED |
| 00-713-I-15 | 09/975,059 11/11/01 | See 00-713-I-1 | ALLOWED |
| 00-713-I-16 | 09/976,601 10/12/01 | See 00-713-I-1 | ALLOWED |
| 00-713-I-17 | 09/976,968 10/12/01 | See 00-713-I-1 | ALLOWED |
| 00-713-I-18 | 09/976,971 10/12/01 | See 00-713-I-1 | U.S. Patent No. 6,682,895, issued 1/27/04 |
| 00-713-I-19 | 09/976,863 10/12/01 | See 00-713-I-1 | PENDING |
| 00-713-I-20 | 09/976,577 10/12/01 | See 00-713-I-1 | U.S. Patent No. 6,720,147, issued April 13, 2004 |
| 00-713-I-21 | 09/976,618 10/12/01 | See 00-713-I-1 | U.S. Patent no. 6,812,334, issued Nov. 2, 2004 |
| 00-713-I-22 | 09/981,344 10/15/01 | See 00-713-I-1 | U.S. Patent No. 6,777,186, issued August 17, 2004 |
| 00-713-I-23 | 09/976,900 10/12/01 | See 00-713-I-1 | ALLOWED |
| 00-713-I-24 | 09/976,617 10/12/01 | See 00-713-I-1 | U.S. Patent No. 6,730,269, filed May 4, 2004 |
| 00-713-I-25 | 09/976,378 10/12/01 | See 00-713-I-1 | PENDING |
| 00-713-i-26 | 10/410,324 04/10/03 | See 00-713-I-1 | PENDING |
| 00-713-L | U.S.S.N. 09/693,005 | Mirkin, Letsinger, Mucic, Storhoff, | U.S. Patent No. 6,495,324, issued |

| ATTY Case No. | Serial No./ Filing Date | Inventors/Title | Status |
|------------------|--|--|---|
| | Filed 10/20/00 | Elghanian/ NANOPARTICLES HAVING OLIGONUCLEOTI DES ATTACHED THERETO AND USES THEREFORE | 12/17/02 |
| 00-713-M | U.S.S.N. 09/693,352 Filed 10/20/00 | Mirkin, Letsinger, Mucic, Storhoff, Elghanian/ NANOPARTICLES HAVING OLIGONUCLEOTI DES ATTACHED THERETO AND USES THEREFORE | U.S. Patent No. 6,417,340, issued 7/9/02 |
| 00-714-G | U.S. 09/830,620 Filed 8/15/01 | Mirkin, Nguyen/ NANOPARTICLES WITH POLYMER SHELLS | PENDING |
| 00-715-A | U.S. 09/760,500 Filed 1/12/01 | Mirkin, Letsinger, Mucic, Storhoff, Elghanian, Taton; Garamella, Li/ METHOD OF ATTACHING OLIGONUCLEOTI DES TO NANOPARTICLES AND PRODUCTS PRODUCED THEREBY | U.S. Patent No. 6,767,702, issued July 27, 2004 |
| 00-715-B | U.S. 10/716,829 Filed 11/18/03 | Mirkin, Letsinger, Mucic, Storhoff, Elghanian, Taton; Garamella, Li/ METHOD OF ATTACHING OLIGONUCLEOTI DES TO NANOPARTICLES AND PRODUCTS PRODUCED THEREBY | Pending |

| ATTY Case No. | Serial No./ Filing Date | Inventors/Title | Status |
|--------------------------|--|---|---|
| 00-1085-A | U.S.S.N. 09/820,279 Filed 3/28/01 | Mirkin,Letsinger, etc./ METHOD AND MATERIALS FOR ASSAYING BIOLOGICAL MATERIALS | U.S. Patent No. 6,750,016, issued June 15, 2004 |
| 00-1085-G | U.S.S.N. 10/640,618 Filed 8/13/03 | Mirkin,Letsinger, etc./ METHOD AND MATERIALS FOR ASSAYING BIOLOGICAL MATERIALS | Pending |
| 00-1086-A | U.S. 09/903,461 Filed 7/11/01 | Letsinger, Garimella/ METHOD OF DETECTION BY ENHANCEMENT OF SILVER STAINING | U.S. Patent No. 6,602,669, Filed 8/5/03 |
| 00-1272-C | U.S.S.N. 10/008,978 Filed 12/7/01 | Mirkin, Letsinger, Mucic, Storhoff, Elghanian, Taton, Garimella, Li, Park, Lu/ NANOPARTICLES HAVING OLIGONUCLEOTI DES ATTACHED THERETO AND USES THEREOF | ALLOWED |
| 01-565-A | USSN 10/125,194 Filed 4/18/02 | Mirkin, Nguyen, Watson, Park/ OLIGONUCLEOTI DE-MODIFIED ROMP POLYMERS AND CO- POLYMERS | PENDING |
| 01-599-A | U.S.S.N. 10/291,291 Filed 11/08/02 | Storhoff/NOVEL THIOL-BASED METHOD FOR ATTACHING OLIGONUCLEOTI DES TO NANOPARTICLES | PENDING |
| 01-661-A | U.S.S.N. | Mirkin, Cao, Jin/ | PENDING |

| ATTY Case No. | Serial No./ Filing Date | Inventors/Title | Status |
|--------------------------|--|--|---------------|
| | 10/034,451 Filed 12/28/01 | DNA-MODIFIED CORE-SHELL AG/AU NANOCRYSTALS | |
| 01-661-C | U.S.S.N. 10/153,483 Filed 5/22/02 | Mirkin, Cao, Jin/ DNA-MODIFIED CORE-SHELL AG/AU NANOCRYSTALS | PENDING |
| 01-661-E | U.S.S.N. 10/397,579 3/26/03 | Mirkin, Cao, Jin/ DNA-MODIFIED CORE-SHELL AG/AU NANOCRYSTALS | PENDING |
| 01-1565-A | U.S.S.N. 10/266,983 Filed 10/08/02 | Park, Taton, Mirkin/ARRAY- BASED ELECTRICAL DETECTION OF DNA USING NANOPARTICLE PROBES | PENDING |
| 01-1633-A | U.S.S.N. 10/266,983 Filed 10/8/02 | Park, Taton, Mirkin/NANOPARI CLES HAVING OLIGONUCLEOTI DES ATTACHED THERE TO AND USES THEREFOR | PENDING |
| 01-1705-A | U.S.S.N. 10/108,211 Filed 3/27/02 | Nam, Park, Mirkin/BIO- BARCODES BASED ON OLIGONUCLEOTI DE-MODIFIED NANOPARTICLES | PENDING |
| 02-338-B | USSN 10/172,428 Filed 6/14/02 | Cao, Jin, Nam, Mirkin/MULTI- CHANNEL DETECTION USING NANOPARTICLE PROBES WITH RAMAN SPECTROSCOPIC | PENDING |

| ATTY Case No. | Serial No./ Filing Date | Inventors/Title | Status |
|------------------|------------------------------|--|---------|
| | | FINGERPRINTS | |
| 02-338-C | 10/431,341 5/7/03 | Cao, Jin, Nam, Mirkin/MULTICHAN- NEL DETECTION USING NANOPARTICLE PROBES WITH RAMAN SPECTROSCOPIC FINGERPRINTS | PENDING |
| 02-1227-A | 10/735,357 Filed 12/12/03 | DIRECT SNP DETECTION WITH UNAMPLIFIED NUCLEIC ACID USING NANOPARTICLE PROBES | PENDING |
| 03-214-A | 10/789,831 Filed 2/27/04 | LABEL-FREE GENE EXPRESSION PROFILING WITH UNIVERSAL NANOPARTICLE PROBES IN MICROARRAY ASSAY FORMAT | PENDING |
| 03-466-C | 10/854,848 Filed 5/27/04 | METHOD FOR DETECTING ANALYTES BASED ON EVANESCENT ILLUMINATION AND SCATTER- BASED DETECTION OF NANOPARTICLE PROBE COMPLEXES | PENDING |
| 03-666-E | 10/877,750 Filed 6/25/04 | BIOBARCODE | PENDING |